PATENT SPECIFICATION

DRAWINGS ATTACHED

851,444

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International Classification:—**F06k.**

The inventors of this invention in the sense of being the actual devisers thereof within the meaning of Section 16 of the Patents Act 1949 are GUY CHAUVIN of 4, Avenue de Verdun, Fontenay-aux-Roses (Seine) France and ROGER GILGUY of 108 rue Beranger, Chatillon-sous-Bagneux (Seine) France, both French citizens.

COMPLETE SPECIFICATION

Improvements in or relating to Vacuum Control Valves

We, COMMISSARIAT A L'ENERGIE ATOMIQUE, an Organisation created in France by Ordonnance No. 45—2563 of October 18th, 1945, of 69, Rue de Varenne, Paris—Seine—France, do hereby declare the invention for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to vacuum control valves of the type including a sliding member.

Advantageously such valves should comply with the following conditions:

—A good gastightness should be obtained so as to permit of maintaining a high vacuum averaging from 10^{-4} to 10^{-5}mm. of mercury even when said device is subjected to high temperatures for instance averaging 1000°C;

—In the open position a free passage of large area should be provided without necessitating undesirably large dimensions for the valve;

—It should be possible to combine two similar valves in immediate juxtaposition to one another, for example to connect two distinct portions of an apparatus and to permit either of connecting them together or of separating them from one another.

According to the present invention there is provided a vacuum control valve capable of withstanding high temperatures, for example of 1000°C, essentially comprising a casing, and a slidable unit movable in said casing by means of an external control member so as either to close or to clear a corresponding opening in the casing, the joints or portions of joints disposed in the proximity of the fluid path to be controlled by the valve and ensuring fluid tight sealing on the one hand between the interior and exterior of the valve and on the other hand in the upstream - downstream direction of the valve when the valve is closed, being arranged to be cooled by means of a fluid circulation circuit extending in the vicinity of said joints or portions of joints.

Two such valves can readily be arranged in combination. The lower portion of the casing of the first valve is mounted on the upper portion of the casing of the second valve. Assembly and separation of the two valves can readily be effected for example by means of screws.

For a better understanding of the present invention and to show how the same may be carried into effect reference will now be made to the accompanying drawings in which like designations indicate like parts and in which,

Fig. 1 is a vertical sectional view of a vacuum control valve,

Fig. 2 is a top view of the lower portion of the casing of the valve, with the sliding unit and the control rod thereof,

Fig. 3 is a detailed view showing a sealing ring interposed between said rod and the lower portion of the casing,

Fig. 4 is a vertical sectional view of the assembly of two vacuum control valves arranged in cooperation, and

Fig. 5 is a view of the structure of Fig. 4 in section by a plane at right angles to the section plane of Fig. 4.

There will now be described the valve shown in Figs. 1 to 3.

In Fig. 1, the valve is shown in closed position. It comprises a casing including an upper portion 1 and a lower portion 2 between which a sliding unit constituted by support plate 3 and grooved cover 4 is slidable.

The upper portion 1 of the casing is fixed to a part 5 (a conduit) of an apparatus carry-

[*Price 3s. 6d.*]

ing the valve device, by means of screws such as 6 and 7, gastightness being ensured by a sealing ring 8 protected against heat by a water circulation circuit 9. The upper portion 1 is also fixed to the lower portion 2 of said casing by screws such as 10 and 11, gastightness between the two portions of the casing being ensured by a sealing ring 12 protected against heat by water circulation circuits 9 and 13.

The lower portion 2 of the casing is fixed to another part 14 (a conduit) of the said apparatus by screws such as 15 and 16, gastightness being ensured by a sealing ring 17 protected against heat by the water circulation circuit 18.

The grooved cover 4 may be tightly applied against the upper portion 1 of the casing. Gastightness is ensured by a sealing ring 19 protected against heat by water circulation circuits 9 and 13. The application of cover 4 against the portion 1 of the casing is obtained by means of a cam 20 which is arranged to be rotated from the outside by means of control rod 21, provided with a lever or button 22. The cam 20 is mounted in support plate 3, which can slide laterally in the lower portion 2 of the casing. Gastightness between said lower portion 2 of the casing and control rod 21 is ensured by means of sealing ring 23 which will be described with reference to Fig. 3.

Fig. 2 is a top plan view of the lower portion 2 of the casing, with the grooved cover 4 and the control rod 21 located therein, the upper portion 1 of the casing being removed.

Fig. 3 is a detailed view of the sealing ring 23. Packing members 24, made for example of rubber, are tightly applied against the lower portion 2 of the casing by means of a metallic ring 25 actuated by a screw 26.

The valve device shown by Figs. 1, 2, 3, is opened as follows:

—the grooved cover 4 is released; for this purpose it suffices to rotate cam 20 through an angle of 90° by means of button 22;

—the sliding unit is retracted, that is to say the whole of grooved cover 4 and support plate 3 is made to slide laterally by pulling button 22 toward the left (Figs. 1 and 2).

In order to close the valve, the same operations are effected in the reverse order.

There will now be descibed, with reference to Figs. 4 and 5, an arrangement including two valves.

Fig. 4 shows the two valves in section by a plane passing through their control rods. The upper valve 27 is open and the lower valve device 28 is closed with its cover 50 applied against the corresponding casing upper portion 46. The upper valve 27 comprises a casing, including upper portion 29 and lower portion 30, and a sliding unit including the grooved cover 31 and the support plate 32.

The upper portion 29 of the casing is fixed to a part 33 (a conduit) of an apparatus carrying the valve device, by means of screws such as 34 and 35. Gastightness is ensured by a sealing ring 36 protected against heat by the water circulation circuit 37. The two portions 29 and 30 of the casing are connected together by means of screws such as 38 and 39. Gastightness is ensured by a sealing ring 40 protected against heat by the water circulation circuits 37 and 41. The grooved cover 31 can be applied against the upper portion 29 of the valve by rotation of cam 42 and the displacement of the sliding unit is obtained by means or rod 43 and control button 44. Gastightness between the lower portion 30 of the casing and control rod 43 is ensured by a sealing ring 45.

The lower valve 28 is identical with the upper valve 27. It comprises the upper portion 46 of the casing with a water circulation circuit 47, the lower portion 48 of the casing with a water circulation circuit 49, grooved cover 50, support plate 51, cam 52, control rod 53, button 54, screws such as 55 and 56 for fixing together the two portions 46 and 48 of the casing and sealing ring 57.

Valve 28 is secured to another part 58 (a conduit) of the said apparatus by weld 59. The two valves are fixed together by means of screws (not shown) which screws extend through valve 27. Gastightness is ensured by a sealing ring 60 protected against heat by the water circulation circuit 47.

Fluidtightness of the system in the closed position is obtained by means of sealing rings 61 and 62 carried by the two grooved covers 31 and 50.

Fig. 5 shows the two valves in the closed position, the upper valve 27 having its grooved cover tightened and the lower valve 28 having its grooved cover 50 released. Fig. 5 shows the cooling circuits. Cooling fluid is admitted at 63, 64, 65 and 66, and is evacuated respectively at 67, 68, 69 and 70, after it has circulated through the chambers 37 and 41 of valve 28.

The operation of each of the two valves is identical to that of valve described with reference to Figs. 1 to 3.

WHAT WE CLAIM IS:—

1. A vacuum control valve capable of withstanding high temperatures, for example of 1000°C, essentially comprising a casing, and a slidable unit movable in said casing by means of an external control member so as either to close or to clear a corresponding opening in the casing, the joints or portions of joints disposed in the proximity of the fluid path to be controlled by the valve and for ensuring fluid-tight sealing on the one hand between the interior and exterior of the valve and on the other hand in the upstream - downstream direction of the valve when the valve is closed, being arranged to be cooled by means of a fluid circulation circuit extending in the

vicinity of said joints or portions of joints.

2. A valve as claimed in claim 1, wherein the sliding unit includes at least one first element capable, when the valve is closed, of being moved at right angles to the sliding displacement of said slidable unit, so as to ensure gastightness by applying a sealing ring against a surface of the casing.

3. A valve as claimed in claim 2, wherein the sliding unit includes, in addition to said first element a second element on which the first element can fit in the manner of a cover.

4. A valve as claimed in claim 2, wherein the control member is essentially constituted by a rod extending through the wall of said casing and provided with a cam.

5. A valve as claimed in claim 1, wherein the casing includes two portions of substantially flat shape, one of the two portions being applied to the other, gastightness between the two portions being ensured by means of a sealing ring arranged to be cooled by the circulation of a fluid in the vicinity thereof.

6. A valve as claimed in claim 1, the valve being mounted at the end of a conduit or part of an apparatus and arranged in combination with a similar valve mounted at the end of another conduit or part of an apparatus, gastightness between the two valves being ensured by means of a sealing ring arranged to be cooled by the circulation of a fluid in the vicinity thereof.

7. A valve as claimed in any one of claims 1 to 4, wherein said sealing means are sealing rings.

8. A valve as claimed in any one of the preceding claims, wherein said circuit is provided in the casing.

9. A vacuum control valve substantially as hereinabove described and illustrated in the accompanying drawings.

FORRESTER, KETLEY & CO.,
Chartered Patent Agents,
Jessel Chambers, 88—90, Chancery Lane,
London, W.C.2., and
Central House, 75, New Street,
Birmingham, 2.

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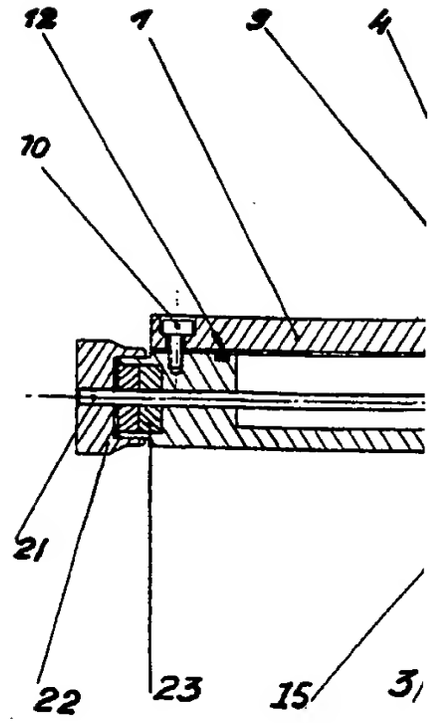

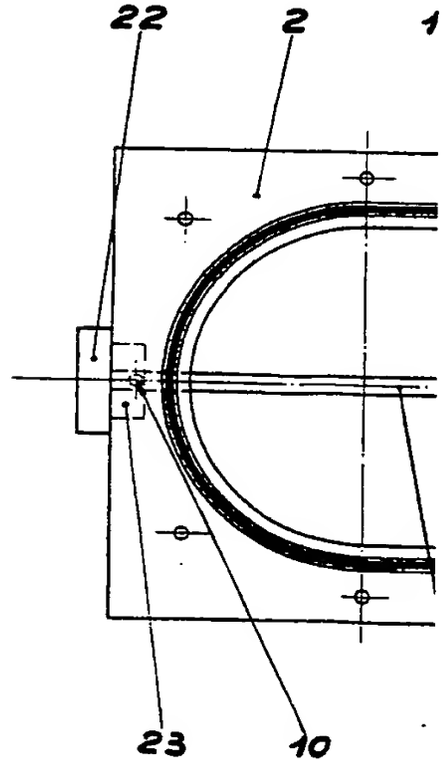

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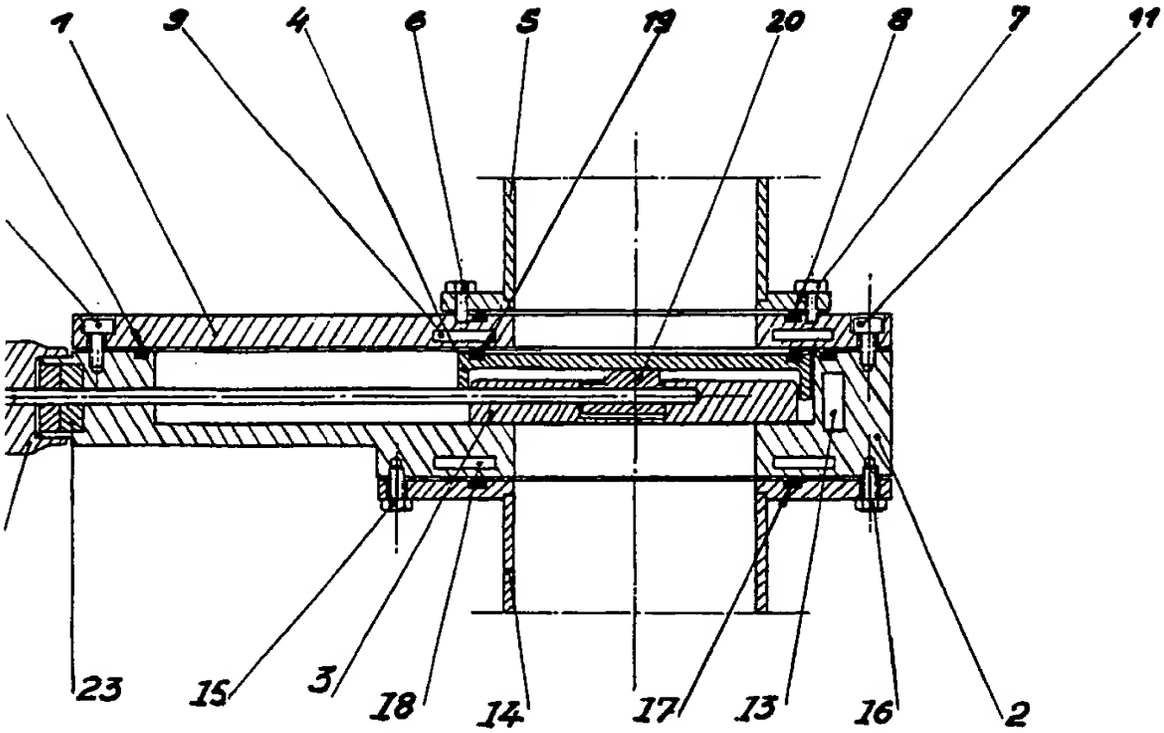

Fig. 1

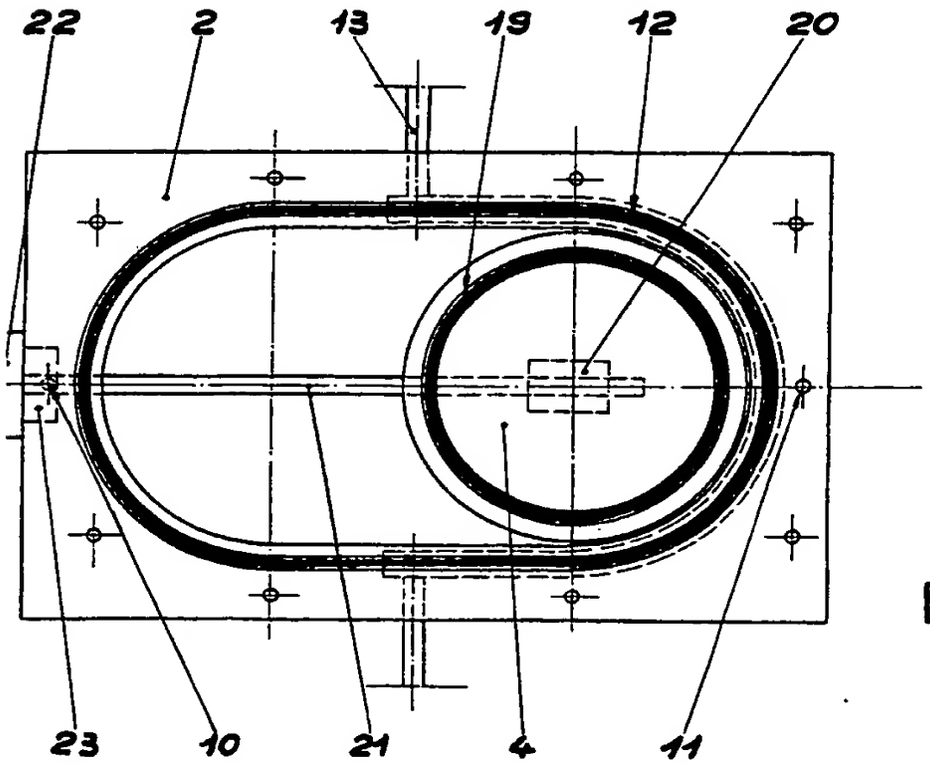

Fig. 2

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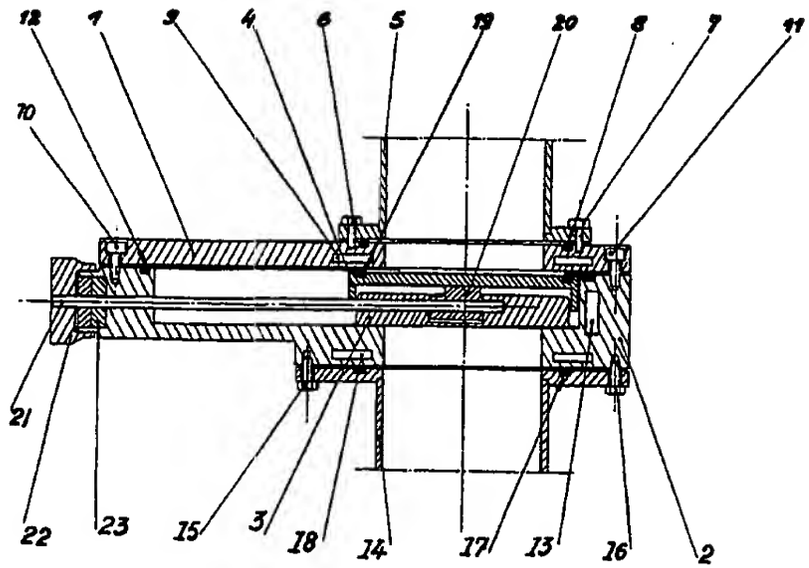


Fig. 1

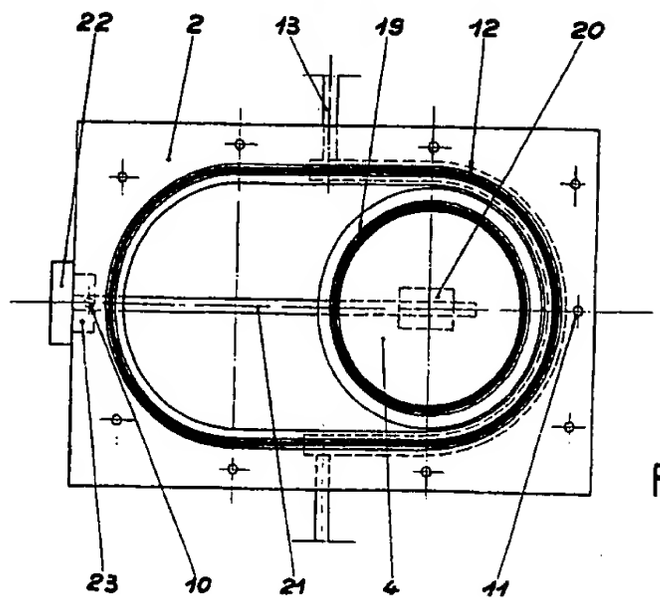


Fig. 2

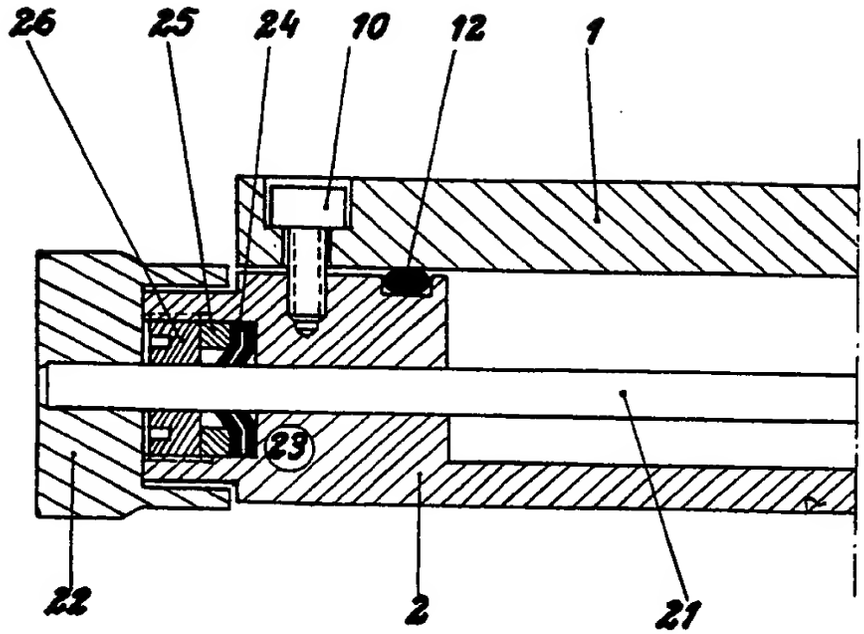
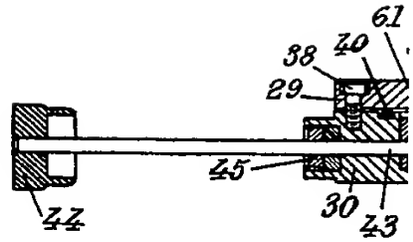


Fig. 3



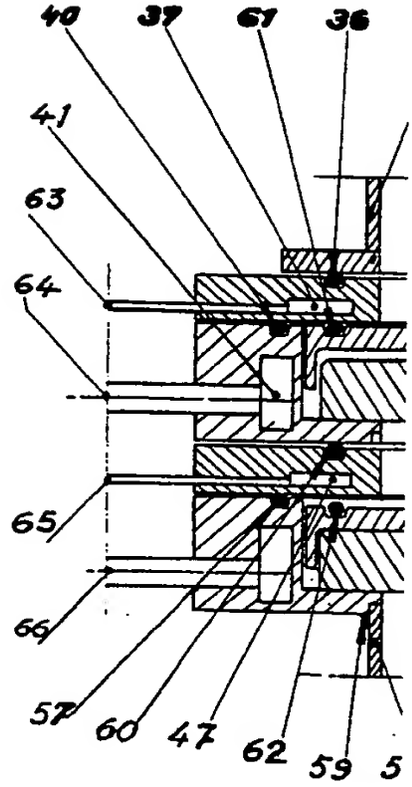


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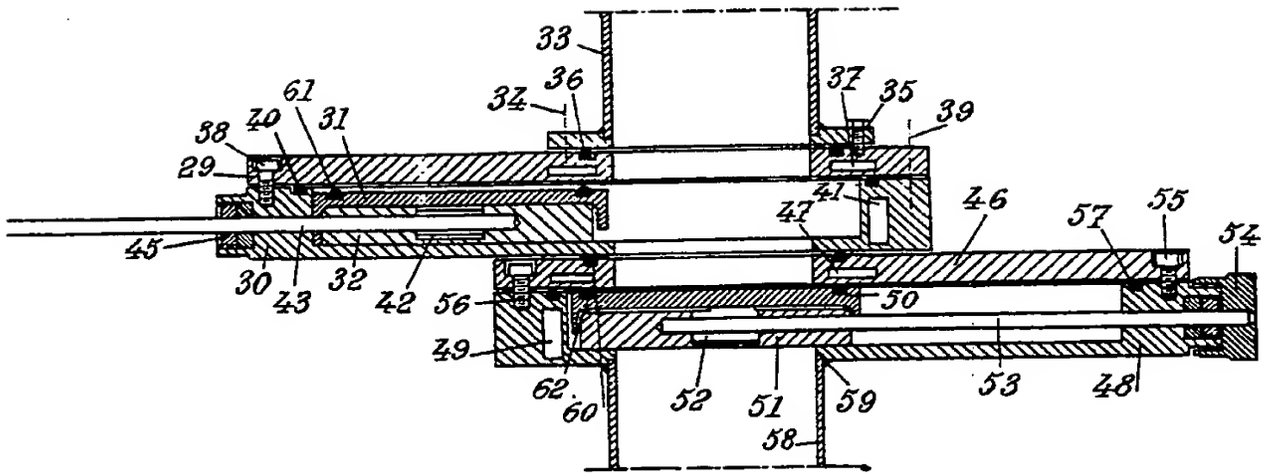
Fig.4.



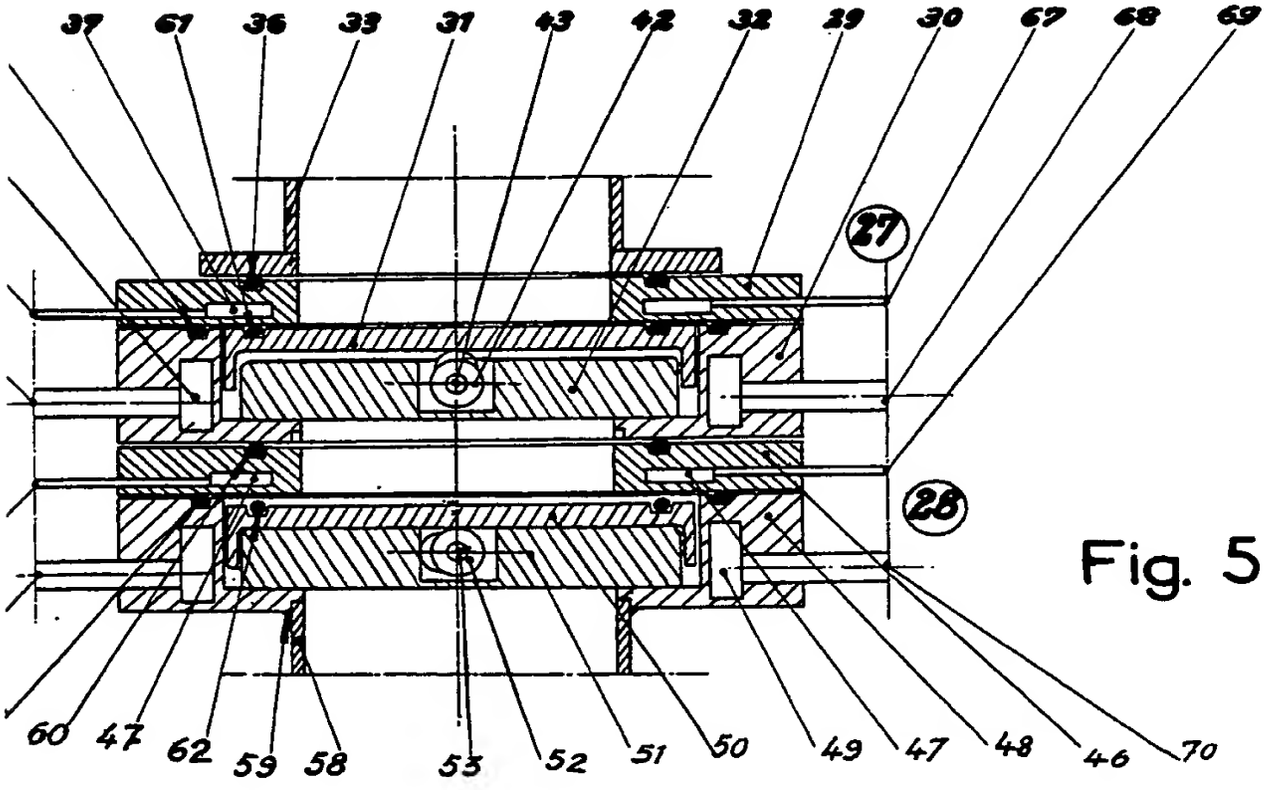


Fig. 5

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Fig. 4.

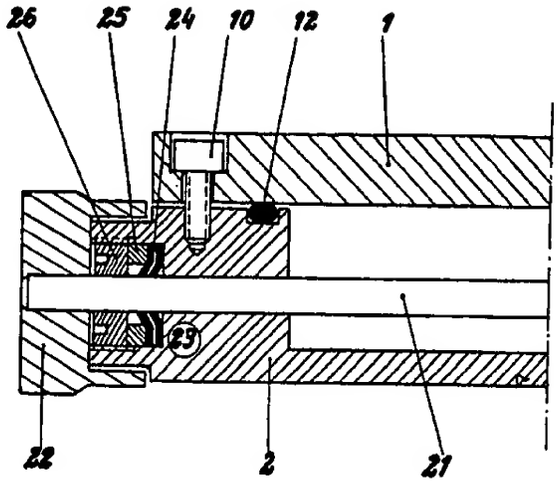
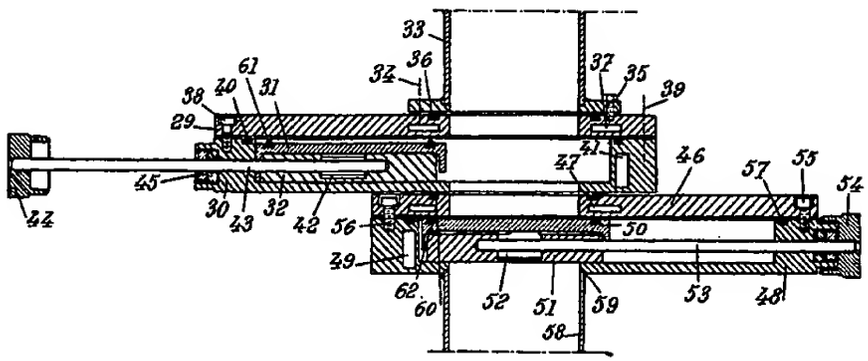


Fig. 3



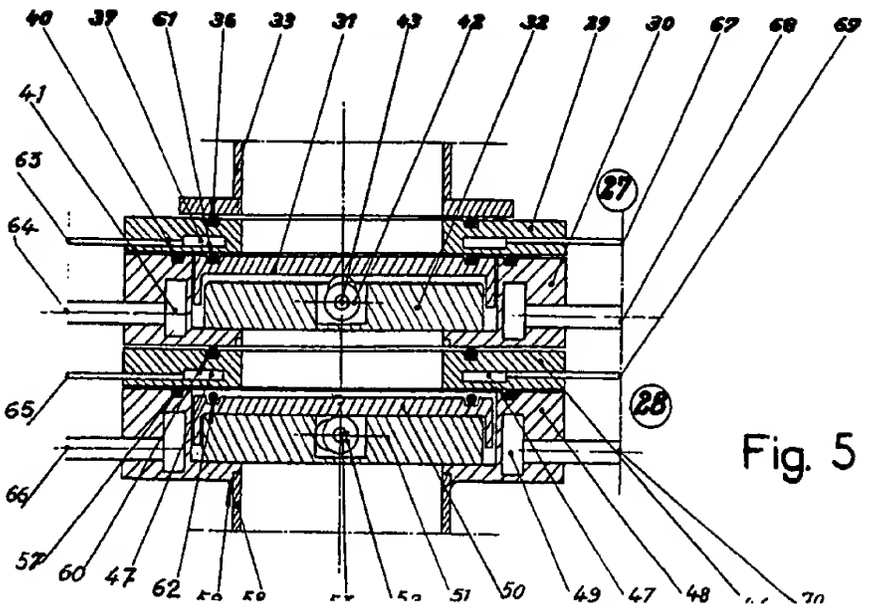


Fig. 5